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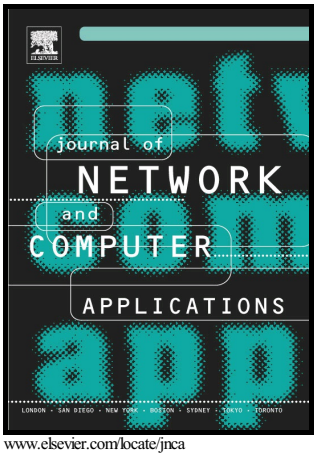

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Smart Context-Aware QoS-Based Admission Control for Biomedical Wireless Sensor Networks

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Abstract

Wireless sensor networks are being used as the enabling technology that helps to support the development of new applications and services targeting the domain of healthcare, in particular, regarding data collection for continuous health monitoring of patients or to help physicians in their diagnosis and further treatment assessment. Therefore, due to the critical nature of both medical data and medical applications, such networks have to satisfy demanding quality of service requirements. Despite the efforts made in the last few years to develop quality of service mechanisms targeting wireless sensor networks and its wide range of applications, the network deployment scenario can severely restrict the network's ability to provide the required performance. Furthermore, the impact of such environments on the network performance is hard to predict and manage due to its random nature. In this way, network planning and management, in complex environments like general or step-down hospital units, is a problem still looking for a solution. In such context, this paper presents a smart context-aware quality of service based admission control method to help engineers, network administrators, and healthcare professionals managing and supervising the admission of new patients to biomedical wireless sensor networks. The proposed method was tested in a small sized hospital. In view of the results achieved during the experiments, the proposed admission control method demonstrated its ability, not only to control the admission of new patients to the biomedical wireless sensor network, but also to find the best location to admit the new patients within the network. By placing the new sensor nodes on the most favourable locations, this method is able to select the network topology in view of mitigating the quality of service provided by the network.

Keywords
Context-Aware QoS; Admission Control; Biomedical Wireless Sensor Networks

1. Introduction

Data gathering of physiological signals for health monitoring should not interfere with the patients' mobility. This may be achieved using wireless technology through the use of